REMARKS

By this amendment, claims 2, 4-5, 9-10 and 14 have been cancelled and claims 1, 3, 8, 12 and 13 have been amended in the application. Currently, claims 1, 3, 6-8, 11-13 and 15 are pending in the application.

Claims 3-5, 6-8, 10-11, 13 and 15 were rejected under 35 USC 112, second paragraph, as being indefinite. In point a) the Examiner stated that it was not clear what was meant by "access size" or "access unit" in claims 3-6, 10, 13, 14 and 15. Also, the Examiner stated that it was not clear what limitation entails especially when used in the sentence "a first access size determined from physical characteristics of an information recording medium or a size less than the first access size is used". Also, the Examiner stated that it was not clear what was meant by "access unit". By this amendment, claim 4, 5, 10 and 15 have been cancelled and claim 3 and 13 have been amended. Claim 3 was amended to recite "The data area managing method according to claim 1, wherein said second access size is identical to a minimum reading and writing size of said information recording medium". Also, claim 13 has been amended to recite "The information processor according to claim 12, wherein said second

access size is identical to a minimum reading and writing size of said information recording medium". It is respectfully submitted that claims 3 and 13 have been amended to clarify the second access size and the phrase "access unit" has been deleted from the claims. In view of these amendments to claims 3 and 13, it is respectfully submitted that the 35 USC 112, second paragraph, rejection has been overcome and should be withdrawn. Applicants respectfully submit that the claimed features of claim 3, 6-8, 11 and 13 are now clear and definite.

In point b) the Examiner additionally stated that limitations of "said information processor uses a first area management information cache having a physical management clock size determined from physical characteristics of said information recording medium or less" and "when said information processor executes said link destination acquisition processing" render the claims indefinite in claim 8. By this amendment, claim 8 has been amended to recite "said information processor executes said link destination acquisition processing, said information processor uses a second area management information cache smaller than said first area management information cache as an access unit of said information recording medium". In view of the amendments to claim 8, applicants respectfully submit that the claimed features of claim 8 are now clear and definite.

Claims 1-5 and 12-15 were rejected under 35 USC 102(e) as being anticipated by Ohbi et al. (U.S. Patent Application Publication No. 2004/0047602). Also, claims 6-11 were rejected under 35 USC 103(a) as being obvious over Ohbi in view of Pfister et al. (U.S. Patent Application Publication No. 2003/0033487).

These rejections are respectfully traversed in view of the remarks below.

The present invention relates to a data area managing method of managing data stored in an information recording medium according to a file system and an information processor employing the data area managing method (see page 1, lines 6-9 of the specification).

In Fig. 1, an information processor 100A includes a CPU 101, a main memory 102, a cache memory 103A, an access controller 104 and a program storage section 105 (see page 7, lines 5-8 of the specification).

The cache memory 103A includes a FAT cache for caching the FAT. To manage the FAT cache, the main memory 102 stores FAT cache management information therein. The program storage section 105 has an application program 106, file system controller 107, and FAT cache controller 108 (see page 7, lines 17-21 of the specification).

An information recording medium 110 has a management information area which stores area management information as file system management information therein and a data area which stores data therein. The management information area is provided with a master boot record and partition table (MBRPT) 111, a partition boot sector (PBS) 112, a FAT 113 and a route directory entry (RDE) 114 (see page 8, lines 6-13 of the specification).

A data area 115 is managed and divided into a plurality of clusters and each cluster stores the data contained in the file therein (see page 9, lines 2-4 of the specification).

Fig. 4 is an explanation view showing an example of a file system constructed on the information recording medium. The example in Fig. 4 assumes the case where a semiconductor memory is used as the information recording medium.

Fig. 5 is a view showing an example of a FAT cache 501 existing on the cache memory 103A. The FAT cache 501 uses a certain area in the cache memory 103A and is managed by the FAT cache controller 108. The FAT cache controller 108 repeats generation and release of a plurality of cache blocks in the cache memory 103A assigned for the FAT cache 501 to retrieve the free area. Furthermore, the FAT cache controller 108 provides the function of acquiring a link destination for the file system controller 107 (see page 16, lines 14-23 of the specification).

As shown in Fig. 6, the free area retrieval processing is performed in response to a file access request issued from the application program 106 to the file system controller 107 in Fig. 1. At that time, the file system controller 107 requests a free area retrieval for the FAT cache controller 108 and the FAT cache controller 108 performs free area retrieval. The FAT cache controller 108 reads the FAT in the FAT cache as appropriate, and returns the cluster number of the acquired free area to the file system controller 107 after retrieving the free area (see page 18, line 18 - page 20, line 2 of the specification).

As shown in Fig. 7, in the acquisition processing, in response to a file access request issued from the application program 106 to the file system controller 107, the file system controller 107 issues a link destination acquisition request to the FAT cache controller 108. Then, the FAT cache controller 108 performs the link destination acquisition processing. The FAT cache controller 108 reads the FAT in the FAT cache as appropriate, and returns the cluster number of the acquired destination to be linked to the file system controller 107 after acquiring a destination to be linked (see page 23, line 20 - page 24, line 5 of the specification).

In the link destination acquisition processing, the access controller 104 accesses to the FAT in units of sectors and reads

the FAT into the FAT cache. In the link destination acquisition processing, since it is referring only to a specific entry of the FAT that enables acquisition of the link destination, the link destination can be rapidly acquired by access in units of sectors as the minimum access unit to the information recording medium.

In the present invention, by changing the access size of the FAT according to the processing steps, the efficiency of the FAT access can be improved. That is, in the free area retrieval processing, by performing access in units of erase blocks, the overhead for reading the FAT can be lessened, thereby shortening the worst time necessary for the free area retrieval processing can be achieved. In acquisition processing, by performing access in units of sectors, the time necessary for one link destination acquisition processing can be shortened (see page 25, line 23 - page 26, line 16 of the specification).

Independent claim 1 has been amended to recite "when said information processor accesses area management information that manages a free area state and link state of the information recording area in said information recording medium as the file information, reading said file information of a first access size from said area management information when retrieving a free area from said area management information; and reading said file information of a second access size smaller than the first access

size from said area management information when retrieving link information from said area management information".

Also, independent claim 12 recites "a file system controller for accessing the area management information through said FAT cache controller and storing data in the information recording medium as a file, wherein said FAT cache has at least one block having a first access size and at least one block having a second access size; and said second access size is smaller than said first access size". These features are not shown or suggested by Ohbi et al., Pfister et al. or any combination of these references.

Ohbi et al. relate to a recording medium suitably for use in a variety of uses and a recording apparatus, a reproducing apparatus, a recording method, and a reproducing method which corresponds to the recording medium (see page 1, paragraph [0001]).

Ohbi et al. disclose that in Fig. 7, the example shows that parts (03h), (18h), (1Fh), (2Bh), and (E3h) are free areas and this status is represented by pointer P-FRA by the link of part tables (03h), (18h), (1Fh), (2Bh), and (E3h). It should be noted that the above-mentioned defective areas and unused part tables are also managed in this manner (see page 8, paragraph [0176]).

Ohbi et al. also disclose that for example, these FAT clusters #0 through #55 store a FAT file system configured by FAT and data files managed by FAT (see page 10, paragraph [0257]).

Ohbi et al. also disclose that it should be noted that the handling of data in the FAT file system is performed on a FAT sector basis on the computer. However, a rewriting operation on the disk is performed on a high-density data cluster basis, so that in the case of the rewriting of one particular FAT sector, the rewriting on the disk is performed in a unit of the high-density data cluster in which this FAT sector is included (see page 10, paragraph [0258]).

Ohbi et al. do not disclose that said information processor accesses area management information that manages a free area state and link state of the information recording area in said information recording medium as the file information, reading said file information of a first access size from said area management information when retrieving a free area from said area management information; and reading said file information of a second access size smaller than the first access size from said area management information when retrieving link information from said area management information as claimed in independent claim 1.

Ohbi et al. also do not disclose that a file system controller for accessing the area management information through said FAT cache controller and storing data in the information recording medium as a file, wherein said FAT cache has at least one block having a first access size and at least one block having a second access size; and said second access size is smaller than said first access size as claimed independent claim 12.

The information processor of one embodiment reads file information in units of the first access size, such as 32, 5 or 22 sectors, when retrieving a free area from the area management information, typically at the time of data writing. The information processor reads file information in units of the second access size, such as 1 sector, when retrieving link information from the area management information, typically at the time of data reading.

The first access size is not always a particular size, but is larger than the second access size.

Ohbi et al., however, does not disclose such features. Paragraph [0258] of Ohbi et al. shows that the handling of data in the FAT file system is performed on a FAT sector basis. On the other hand, a rewriting operation on a disk is performed on a high-density data cluster basis, and in the case of the rewriting

of one FAT sector, the rewriting on the disk is performed in unit of high-density data cluster including this FAT sector. It only shows that the access size in FAT file system and the rewriting size are different each other.

To sum up, Ohbi et al. does not disclose that the information processor reads file information in units of the first access size when retrieving a free area from the area management information.

Therefore, applicants respectfully submit that the description of Ohbi et al. do not disclose the claimed features of the present invention.

Furthermore, the presently claimed invention discloses that when accessing the information, the access size has changed corresponding to a free area retrieval processing process and a link destination acquisition processing process. On the other hand, the paragraphs [0257] and [0258] of Ohbi et al. do not disclose such functions.

In addition, the controller 3 of Ohbi controls receiving and transmitting reproduced data and data to be recorded, and the controller 3 of Ohbi does not control the FAT caches as claimed in claim 12.

For these reasons, it is believed that Ohbi et al. do not show or suggest the present claimed features of the present

invention. Applicants also submit that Pfister et al. do not make up for the deficiencies in Ohbi et al.

Pfister et al. relate to an apparatus and method for maintaining the correctness of data that has been cached or locally copied in a distributed computing system having a number of separate computing nodes (see page 1, paragraph [0002]).

Pfister et al. disclose nodes 1200 and 1202 and a node 1204 with a lock table. Each node 1200 or 1202 has one cache, respectively. The lock table is used for blocking unwanted access.

Pfister et al. do not disclose said information processor accesses area management information that manages a free area state and link state of the information recording area in said information recording medium as the file information, reading said file information of a first access size from said area management information when retrieving a free area from said area management information; and reading said file information of a second access size smaller than the first access size from said area management information when retrieving link information from said area management information as claimed in independent claim 1.

Pfister et al. also do not disclose that a file system controller for accessing the area management information through

said FAT cache controller and storing data in the information recording medium as a file, wherein said FAT cache has at least one block having a first access size and at least one block having a second access size; and said second access size is smaller than said first access size as claimed independent claim 12.

It is therefore respectfully submitted that Ohbi et al. and Pfister et al., individually or in combination, do not teach, disclose or suggest the presently claimed invention and it would not have been obvious to one of ordinary skill in the art to combine these references to render the present claims obvious.

Ohbi et al. and Pfister et al. also do not disclose many features of dependent claims 3, 6-8, 11, 13 and 15.

For example, Ohbi et al. and Pfister et al. do not disclose that two caches each having a different management block size are provided as area management information caches in the information processor, and by alternatively using said two caches for different purposes, the access size is changed according to the processing executed by the information processor as claimed in dependent claim 6. Applicants respectfully submit that the method of Pfister et al. is different from the method as claimed in claim 6.

Therefore, allowance of these dependent claims is also respectfully requested.

In view of foregoing claim amendments and remarks, it is respectfully submitted that the application is now in condition for allowance and an action to this effect is respectfully requested.

If there are any questions or concerns regarding the amendments or these remarks, the Examiner is requested to telephone the undersigned at the telephone number listed below.

Respectfully submitted,

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